1-1-2003

Using WebCT as a course supplement to facilitate a learner-centered environment : a case study of a communication technology course

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Using WebCT as a course supplement to facilitate a learner-centered environment: A case study of a communication technology course

by

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A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Journalism and Mass Communication

Program of Study Committee:
Eric Abbott (Major Professor)
Scott Chadwick
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Iowa State University

Ames, Iowa

2003

Graduate College
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CHAPTER 1: INTRODUCTION

Emerging educational technology is dramatically challenging the notion of teaching and learning. New collaborative and communication technology is altering the manner by which students learn, interact, and build relationships. The advances of instructional technology in conjunction with learning theory are fundamentally redefining what it means to be a student and an instructor (Bonk & King, 1998). The use of online technology in education is on the rise, and therefore it is imperative to understand its application and effects. There are many comparison studies that examine the effectiveness of online learning in relation to traditional face-to-face learning. While these studies are valuable, they do not address learning environments that blend the two.

Web-supplemented courses are face-to-face courses that capitalize on the inherent strengths of educational technology, while not sacrificing the benefits of a traditional classroom. At Iowa State University, the majority of the courses in the online course management system (WebCT) are Web-supplemented courses. The large number of Web-supplemented courses in the educational environment supports the need for research in this area.

Research has shown the benefits of using online technology, particularly communication technology, in creating a more collaborative, student-oriented atmosphere. Research has also shown the positive impacts of a learner-centered approach to education. This study evaluates and identifies how technology can be used in a Web-supplemented course to effectively create a learner-centered classroom. This is an exploratory study that examines the relationships between students, technology, and the instructor and addresses the issues of motivation, experience, attitudes, and strategic use of the technology by the instructor and instructional designer in a Web-supplemented course with a learner-centered environment.

CHAPTER 2: LITERATURE REVIEW

BACKGROUND INFORMATION

It is important to understand the context for which this case study is structured. This particular course is a traditional face-to-face class that uses the course management system WebCT to offer additional online capabilities. Specifically, the online learning tools evaluated in this study are the communication and collaboration tools such as the discussion board and chat room. The manner in which these tools were used is consistent with the principles of a learner-centered approach to instruction (APA, 1995; Alexander & Murphy, 1998). This study evaluates the effectiveness of online tools to support learner-centered teaching, its impact on student motivation and attitude, and experience of the instructor and instructional designer.

Learner-Centered Instruction

Defining learner-centered instruction can be a difficult task because the idea incorporates several elements. McCombs and Whisler (1997) define learner-centered as:

> "the perspective that couples a focus on individual learners (their heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs) with a focus on learning (the best available knowledge about learning and how it occurs and about teaching practices that are most effective in promoting the highest levels of motivation, learning, and achievement for all learners)," (p. 9).

A learner-centered approach to teaching emphasizes the students' characteristics as well as the methods employed to address them and promote learning. The focus is both on the learner and the learning.

There is a growing body of research supporting the idea that a learner-centered model leads to increased motivation, learning, and achievement from students (McCombs & Whisler, 1997; Lambert & McCombs, 1998; Alexander & Murphy, 1998). Traditional teaching methods, such as lectures, where the teacher is the dominate figure in the classroom, do not adequately acknowledge the role of the student in the learning process. Although lectures are an effective method, research has shown that lectures are not always as effective as other, more learner-centered methods (i.e. Huba & Freed, 2000).

Based on a synthesis of the available research, the American Psychological Association and Mid-Continent Regional Educational Laboratory developed a list of 12 learner-cent principles in five categories; metacognitive and cognitive affective, developmental, personal and social, and indivi differences (APA Presidential Task Force on Psychology in Education, 1993). A few years later, another American Psychological Association task force (1995) revised the list to 14 learner-centered psychological principles within four

categories. These principles are strongly supported by educational and psychological research (Alexander & Murphy, 1998) and serve as a basis to promote learning in a learner-centered environment (Lambert & McCombs, 1998).

Alexander and Murphy (1998) further distill the 14 principles to a list of five general statements. These statements are based on the topics of the knowledge base, strategic processing or executive control, motivation and affect, development and individual differences, and situation or context (see Alexander & Murphy, 1998). For the principles dealing with the knowledge base, students' existing knowledge is the foundation for all future learning and affects how new information is processed. Strategic processing or executive control refers to the students' ability to regulate their thoughts and reflect on their learning. The topic of motivation and affect recognizes the significant role of motivation and deals with students' intrinsic motivation as well as situational motivation inherent in specific learning activities. Development and individual differences recognizes that learning is a unique experience for everyone. And finally, situation of context addresses the issue that learning is both an individual and socially constructed process (Alexander & Murphy, 1998). These statements, along

with the 14 learner-centered psychological principles, serve as the overall framework for integrating online technology into the classroom for this case study. They are the learner-centered scaffolds for which all activities throughout the semester were created.

Online Learning Technology

Based on the educational shift toward learner-centered instruction, it is important to tailor new educational technologies to foster learner-centered environments. Oliver (2000) cautions the use of technology that promotes only instructivist activity. Rather than focusing on technology that merely delivers content, the tools may be used to promote collaboration and active learning, as well as methods to increase motivation and achievement. A primary strength of online learning is the collaborative interactions made possible between the students. Knowlton (2000) argues that online learning must be learner-centered. If instructors used a teacher-centered approach and simply used the Internet to deliver course material with no emphasis on interaction with the faculty, other students, and the content, it defeats the purpose of even having an instructor (Knowlton, 2000). What that amounts to is simply an online textbook. Strategies for

using the technology to create collaborative environments will be addressed later in this review.

Similar to the learner-centered principles, Chickering and Gamson (1991) developed a list of seven principles of good practice for undergraduate education. These principles were distilled from years of research on undergraduate education. The principles outline good practice as:

- encouraging contact between students and faculty;
- developing cooperation among students;
- using active learning techniques;
- providing feedback;
- emphasizing time on task;
- communicating high expectations;
- and, respecting diverse talents and ways of learning, (Chickering and Gamson, 1991).

With the development of new technology, Chickering and Ehrmann (1996) applied the seven principles to the use of technology in the classroom. Communication technology in particular augments face-to-face communication, collaboration, active learning, feedback, and is an important factor for student motivation and involvement (Chickering & Ehrmann, 1996). Instruction can be supported in a variety of ways, with a variety of technologies, but as with many situations, some tools serve the purpose better than others.

Although there are plenty of online tools that facilitate the delivery of content, communication technology is necessary

in the online learning world. Tools that support interaction are important for developing and maintaining collaborative, learner-centered environments. Millis (n.d.) further supports Chickering and Gamson's (1991) first two principles of good practice by pointing out that much of the research on "students' success in higher education points to positive interactions and communication among students and between students and teachers." E-mail, chat and the discussion board are all online communication tools that can be used to foster this type of interaction.

Web-Supplemented Courses:

For the purpose of this case study, a Web-supplemented course is defined as a course that integrates the use of online learning tools within a traditional face-to-face classroom setting. Those available tools consist of communication tools, evaluation tools, content tools, and student management tools (such as student progress and an online gradebook). With this collection of tools at the instructor's disposal, it is up to the instructor to choose the tools that work best for him or her, and in this case study, which tools best foster a learner-centered environment. Web-supplemented courses have the benefit of offering the convenience and options afforded to online courses without

completely abandoning the face-to-face interaction students are accustomed to (Young, 2002). Students' desires for social contact are met through Web-supplemented courses and avoid the feelings of isolation often reported by online learners (Peters, 2001). Dabbagh (2002) outlines other advantages to Web-supplemented courses such as archiving classroom activity, increasing participation and communication options, encouraging active learning, and facilitating feedback and collaboration.

Web-supplemented courses have been found to be more effective in teaching. Chadwick (1999) found that students did better in a traditional face-to-face class that was Web-supplemented than in the same course taught only in class (face-to-face) and one taught completely online (Web-based). The study also found that students performed similarly in the Web-based and face-to-face courses (Chadwick, 1999). The Research Initiative for Teaching Effectiveness at the University of Central Florida also found Web-supported courses to be equivalent or slightly more effective than face-to-face courses (Young, 2002). These findings support the notion that Web-supplemented courses can be effective when used in a learning environment. It also hints at the idea that students

may have options on how they choose to learn since the Web-based and face-to-face courses produced similar results.

WebCT

Iowa State University centrally supports a Web Course Management tool called WebCT. At the end of the spring 2002 semester, there were about 14,500 unique students enrolled in 357 active courses at ISU (Yang, 2002). The number of students enrolled in courses, as well as the number of active courses available on the WebCT server, has more than tripled from Spring 2001 to Spring 2002 (Yang, 2002). Of the 357 active WebCT courses, only 34 of them were used as completely online courses with no face-to-face component (K. Phelps, personal communication, September 10, 2002). This means more than 90 percent of these courses were used as Web-supplements to traditional classes, which is another reason why case studies on Web-supplemented courses are important. Even without the research supporting the use of Web-supplemented courses, studies are needed because instructors are already using the new classroom technology tools, and its use will continue to grow.

Computer-Mediated Communication

Computerized technology that facilitates interaction between people over the Internet has caused significant change

in communication practices. Computer-mediated communication (CMC) such as e-mail, threaded discussion boards, listservs, and online chat rooms have quickly become an integral part in our interaction with others. Much is being written on the effectiveness of CMC in comparison with face-to-face (FTF) interaction from establishing relationships, communities, and discussion.

Using computer-mediated communication for online learning is another potential use of this technology. As with other uses, the effectiveness of online learning is also a topic of debate. Much of the literature discusses the potential benefits of using CMC for education. Using CMC can actively engage students in the learning experience (McComb, 1994), students may confront others' ideas and develop new understandings (Ruberg et al., 1996), and CMC may decrease leader-centered communication by allowing more participation. (Yagelski & Grabill, 1998).

Other benefits outlined by McComb (1994) are that learning is extended outside the classroom, the balance of power is more equalized between instructor and students, and it is an efficient way to conduct discourse. CMC may encourage more participation among students, reduce the sense of embarrassment often associated with speaking up in class, and

allows all voices to be heard regardless of limited class time (Olaniran et al., 1996).

Communication and collaboration may be increased by CMC because everyone has the ablilty to participate, and because these activities are not limited by time-constraints or communication apprehension associated with speaking up in class. These qualities inherent with CMC closely coincide with the learner-centered principles (APA, 1995), thus strengthening the notion that these tools effectively can be used to promote such a learning environment. Based on the research, this exploratory study evaluates the result of the learning experience through the merger of supplemental online technology and the learner-centered principles.

STUDENT CHOICE AND MOTIVATION

The student plays a key role in a learner-centered classroom. Learner-centered instruction not only deals with the instructional material, but builds upon students' history as well as cognitive and social understanding (McCombs & Whisler, 1997). Students' attitudes and perceptions are important considerations. To ignore the influence of the learner in the classroom is to downplay their importance in a learning environment. In a learner-centered approach, responsibilities traditionally viewed as part of the teaching

role are shifted to the learner. "Students in learner-centered classrooms are often involved in the selection and planning of lessons, assignments, and even units of study. Similarly, they are given responsibility—to plan, direct, and carry out their assignments," (McCombs & Whisler, 1997, p.94). This method of giving students more ownership of their learning creates a more engaging environment.

The general approach to learner-centered instruction is to recognize the importance of students as active participants in the classroom by acknowledging individual differences and allowing students to have ownership of the material (APA, 1995). McCombs and Whisler (1997) suggest a relationship between student achievement and active learning practices and supportive environments. They also contend that increasing motivation by giving students some ownership of the material encourages students to take on more challenging and involved roles in the learning process.

This innate human desire to control one's own environment and outcomes is referred to by Deci and Ryan (1985) as self-determination. Embedding learner control in the academic environment promotes intrinsic motivation by affording choice to the students. "We have posited a basic, innate propensity to be self-determining that leads organisms to engage in

interesting behaviors, which typically has the benefit of developing competencies, and of working toward a flexible accommodation with the social environment," (Deci & Ryan, 1985, 38). A key principle of the learner-centered classroom is self-determination.

Motivation is important for cultivating the students' willingness to learn. If students are not committed to learning, they cannot become independent learners; therefore it is important to identify ways to motivate students (Donald, 1997). Aside from developing lifelong learners, successfully motivating students can increase achievement. Students who adopt a deeper approach to learning experience more satisfaction, higher outcomes and better grades (Ramsden, 1992). Ryan (1995) also recognizes the importance of motivation in learning and how student ownership can enhance that motivation.

> "First, the research is clear that motivation to learn and to take responsibility for one's own learning is enhanced when the basic needs for autonomy and control over the learning process are met. Second, once ownership over the learning process occurs, learning becomes intrinsically motivating because one is in charge of making decisions that are fueled by personal interests and goals" (Ryan, 1995, p. 401).

Efforts to motivate students by recognizing the human desire for self-determination should therefore be a goal of the instructor.

In a classroom environment that utilizes online learning tools, the instructor has additional capabilities to use the technology to increase student motivation. Technology can therefore be a tool to create more positive attitudes and increase motivation. Sanders and Morrison-Shetlar (2001) found evidence that students continued to use the tools, even when it was not required of them. "This indication of self-learning and self-motivation was an exciting finding in the study and further emphasized the importance of providing an asynchronous learning environment," (Sanders and Morrison-Shetlar, 2001, p. 257)."

Use of these tools may shift the students into more active learning roles. Through his research, Chizmar had an epiphany that the best way to teach face-to-face students is as if they were online, because students would be forced into ownership of their learning through active learning pedagogies (Chizmar and Walbert, 1999). Discussion and collaboration promotes achievement and satisfaction among students (Clark, 2001), and communication technology encourages this behavior. Strategic use of the technology can further capitalize on the intrinsic motivation of students by promoting ownership of their own learning.

Although the literature supports the importance of student choice, the idea of learner control is something that may be alien and uncomfortable to those who have more experience as passive members in their learning. Previous studies have not asked whether students would prefer learning in the traditional lecture-style classroom, or have more ownership in a learner-centered classroom. When given the opportunity, will students be open to taking on ownership and responsibility, and what effect will that decision have on their motivation to learn? How can a Web-supplemented course promote motivation? These issues are addressed in this study's first research question.

> **Research Question #1:** What are the motivational effects of giving students a choice in a Web-supplemented learning environment?

STUDENT ATTITUDES

Students are an important part of learner-centered instruction, and understanding students' perceptions and attitudes about the experience will be helpful in identifying ways to motivate them as learners. Learner-centered instruction may not be familiar territory since most students enter college with an educational background where the responsibility for learning is cn the teacher as opposed to the student (Donald, 1997). Because of this shift of

responsibility to students, it is important to consider their attitudes and perceptions, which may promote or inhibit the learning process (Donald, 1997). Although previous studies have supported the benefits of taking a learner-centered approach, it is not clear how the students react to such a dramatic shift in a learning environment.

In a learner-centered environment using technology, it is equally important to consider how technology may affect their attitudes about the class and how they will interact with it. With the increasing trend to move courses to a Web-based or Web-supplemented format, it is important for higher education institutions to be aware of student satisfaction. "The lone student scrolling through pages of on-line text is a step backward in terms of quality of teaching and learning. There is therefore a need to gather information about the experiences of students engaged in study in the new flexible delivery modes," (Curtis & Lawson, 2001, 21). If the learner-centered principles stress the consideration of the uniqueness of the student, it also seems necessary to gauge how the students feel about various teaching strategies, including the use of communication technology as a supplement.

It has been argued that CMC promotes experimentation, sharing of ideas, increased and more diverse participation,

and more collaboration (Ruberg, Moore, & Taylor, 1996). Although there is much written about the benefits of online learning, there are many factors that influence the success of these courses. Fishman (1999) did a study of students' uses of different CMC tools (Email, Usenet news, and a collaboratory notebook). He found that when designing courses for the online environment it is important to consider the students' prior experience with computers, their communication apprehension levels, and their academic self-worth (Fishman, 1999). It is important to remember that not all students are created equally.

Initial Student Attitudes

Although CMC and online learning are hot topics in education today, there is still limited research on the actual effectiveness and the best practices for incorporating it into the curriculum. Although it has potential, students still perceive face-to-face classes as more effective and satisfying (Olaniran et al., 1996). In a Web-supplemented course, students enjoy the benefit of the face-to-face class, as well as benefit from the interaction made possible through CMC. In a survey of student attitudes, McMurdo and Meadows (1996) concluded students prefer computer-mediated communication to be a complement rather than a substitute to learning.

Similarly, in a survey of Business Enterprise students' experiences with WebCT, Chadwick and Bayley (1999) suggested that students were also more receptive to the use of educational technology as a supplement rather than a replacement of the face-to-face class.

In Web-supplemented classrooms, technology also has the potential to become more of a hindrance than a help. How do students who have limited experience with online learning tools and CMC feel about being thrust into a technologically foreign environment? Research may suggest that students are open to these types of learning situations. In surveys conducted by the State University of New York (SUNY) Learning Network it was found that lack of previous computer experience was not a barrier to online learning (Fredericksen, et. al., 2000). In fact, Mitra and Steffensmeier (2000) reported that students, regardless of computer background, felt computer use in education "was an expected and natural development in the pedagogic process," (428). Students may not only be open to the use of learning technology, but also expect it as a natural evolution of the educational process.

The Effect of Experience

Students may be open to using the technology in the classroom, but how are student attitudes affected by actually

participating in an online or Web-supplemented class? In the process of using the technology in an academic setting, it is also possible that student attitudes may change. Mitra and Steffensmeier (2000) analyzed three years of a five year longitudinal study of "computer-enriched environments" and found that as students were exposed to the technology, they tended to view computer use more positively, and appreciated the interactions made possible through the technology. Through repeated exposure, students may become more comfortable with the technology and more willing to see it as a valid addition to the classroom.

Student attitudes toward technology are not important if the use of the technology is merely a novelty and does little to aid in the learning process. Computer use in the classroom has been shown to influence attitudes toward learning. In a review of 219 research studies from 1990 to 1997, Sivin-Kachala concluded that use of computers for instruction actually improved student attitudes toward learning (Schacter, 1999). Technology can also promote more active learning situations. In a study by Shaw and Pieter (2000), students felt the use of technology in the class made the material easier to understand, made the instructor more accessible, and enabled them to have a more active role in the class. By

influencing the students, the use of technology in the classroom may promote higher learning outcomes.

In a survey of all Iowa State University students enrolled in WebCT courses in the spring 2001 semester, 58 percent of the 978 respondents believed the use of WebCT in class enhanced their learning. 31.5 percent of respondents were neutral and 10.6 percent felt the use of WebCT hampered their learning (Instructional Technology Center, 2001). These results must be interpreted with caution because the survey included all WebCT courses at Iowa State University, and the use of WebCT in these courses was varied. These results do give evidence that many Iowa State students find the use of this technology beneficial to their learning. Similarly, in an exploratory study by Lindner and Murphy (2001), 72 percent felt WebCT contributed to their success in the course and 89 percent had positive perceptions of WebCT. The numbers of online courses or courses with online components are growing rapidly and the need to understand the technology and the student experience with it in an educational environment is paramount.

Much of the research on student attitudes toward online learning deals specifically with the use of the technology as a replacement of the traditional face-to-face classroom.

Although research dealing with completely online courses is important, this neglects a large population of students who are using the technology in a different manner. Web course management tools such as WebCT are largely used as a course supplement by instructors, and students recognize the benefit of using the tools in an additive versus substitutive approach (McMurdo and Meadows, 1996; Chadwick and Bayley, 1999). First, there is a need for further study of student attitudes in areas of CMC and computers in which they have little or no experience. Second, in order to determine the effectiveness of these tools, it is important to determine the effect of exposing students to the technology. This case study addresses these issues through the following research questions dealing with student attitudes.

> **Research Question #2**: What are students' initial experience and attitudes toward learning and the use of technology in a Web-supplemented class?
>
> **Research Question #3**: How did a Web-supplemented experience affect their attitudes toward learning and the technology?

THE INSTRUCTOR AND INSTRUCTIONAL DESIGNER

Pine and Boy (1977) consider learner centeredness as more of an attitude than a technique; it is up to the instructor to bring that attitude to the classroom. This literature review has discussed the benefits of learner-centered instruction,

the importance of student experience and attitude, and the benefit of Web-supplemented technology in a learner-centered classroom. The instructor must successfully blend the technology with the learner-centered principles to complete the model. The side effect of this merger is the instructor must examine ways to maximize the impact of learning opportunities in the traditional face-to-face classroom as well (Alexander & Boud, 2001).

Staying up-to-date with the ever-changing landscape of educational technology may be a barrier for some instructors, which is why this case study includes the instructional designer with the instructor. It is the instructional designer's role to have an understanding of the current technology and consult with the faculty on how to best incorporate it and meet the learning objectives. Both the instructor and instructional designer share a common goal in this case, which is to facilitate learning through the use of technology. A partnership with an instructional designer can free up the instructor to focus less on technology and more on pedagogy.

In transferring elements of a course to the digital domain, it is important not to simply create an online textbook. Instructors should focus less on using the Internet

to deliver course material and more on using the available tools to create "virtual contexts where students can learn collectively and collaboratively," (Arbaugh, 2000, 229). Although technology is a big part of the Web-supplemented environment, the value of its application is determined more by how the instructor constructs the learning than by the inherent qualities of the technology (Jackson & Anagnostopoulou, 2001).

Research supports the benefits of learner-centered instruction, and online technology and computer-mediated communication has been shown to support this approach. It is up to the instructor and instructional designer to design the course to meet the learning needs of the students in a learner-centered environment. Simply giving students access to one another will not guarantee that they will communicate (Yagelski & Grabill, 1998). According to Coomey and Stephenson (2001) the literature supports the notion that in order for dialogue to be successful, it must be integrated into the design. Designing active learning activities engages the students in learning, and allowing students some control over content, course flow, and assessment helps to motivate students with diverse learning styles (Coomey & Stephenson, 2001).

Strategic use of the technology is important for a successful web-supplemented course, and the instructor must carefully incorporate these strategies. Alexander and Murphy (1998) suggest that an important step for faculty is to identify the strategies that are most effective for facilitating a learner-centered environment. Good instruction matches the teaching strategies to the students learning goals as well as their unique knowledge base and learning styles (Sparkes, 1999; Alexander & Murphy, 1998). Understanding the learner-centered principles will make it easier for the instructor and instructional designer to develop learning activities that increase motivation and promote active learning. It was argued earlier that the communication and collaboration tools are relevant for this.

Learner-Centered Strategies with Technology

The instructor may ease the apprehension often associated with computers by providing the appropriate training and support. (McMurdo & Meadows, 1996; Olaniran et al., 1996). This can be accomplished through in-class demonstrations or no-credit, ice-breaking exercises designed to introduce the students to the technology without the fear of having a grade attached. An easy way to introduce students to the communication tools, especially the discussion board, is to

require the students to introduce themselves online (i.e. Canada, 2000; Palloff & Pratt, 1999; Weiss, 2000).

Not only do online introductions expose students to the online tools, they also begin to establish a community of learners. CMC is advantageous in that it encourages community and allows for a high level of involvement from all students (Yagelski & Grabill, 1998). These communities in turn reduce anxiety and provide a safe environment for collaboration (Bonk & Cummings, 1998). While these tools are being used to establish a community of learners, it is up to the instructor to frame the community around clear goals and objectives (Knowlton, 2000).

The role of the instructor in the learning community is that of a facilitator (Morrison & Guenther, 2000). Using CMC allows the instructor to facilitate collaborative learning; however, the instructor needs to find balance between giving enough feedback to promote continued discourse while not dominating the discussions. From a learner-centered perspective, offering feedback is important to address individual differences, nurture motivation, and set high standards (Bonk & Cummings, 1998). Another way to promote online discussion is by integrating what is said in the discussion board into the classroom. In a study conducted by

Yagelski and Grabill (1998), it was found that students did not see the discussions as an integral part of the course, so they did not contribute as much.

CMC tools can also be used to structure active and engaging activities (McComb, 1994; Bonk & Cummings, 1998; Hiltz et al., 2000). Such activities include problem-based learning, collaboration with peers or experts, reciprocal teaching, and reflection (Oliver, 2000). As mentioned earlier, the collaborative properties of CMC lends itself to the motivational strategy of promoting student ownership of the course (Bonk & Cummings, 1998; Oliver, 2000; Panitz, 1999). Motivation can also be increased by recognizing individual differences. This means being aware of students' diverse interests, backgrounds, and perspectives. One way of addressing differences is to give students options of how to engage the material. This can be done by structuring activities with clear objectives that are flexible enough to appeal to everyone.

In a learner-centered class, the instructor needs to identify authentic, relevant tasks to assign the students. For example, problem-based learning is a learner-centered activity that promotes active construction of knowledge through personal inquiry and peer discourse (Oliver, 2000). Activities

such as these are flexible enough to engage students from a variety of backgrounds. Technology not only promotes these types of activities, but also frees the instructor to try roles other than the lecturer. As a facilitator, the instructor makes sure the students are on task and introduces activities that engage learning. As a social director, the instructor establishes a safe environment and an active learning community (Palloff & Pratt, 1999).

It is also important to recognize that simply using the CMC technology does not automatically guarantee success. Threaded discussions may not be used effectively, or may be dominated by the teacher or those students who more often speak out in class. To effectively use the technology, Yagelski and Grabill (1998) suggest setting clear objectives and policies for the use of a discussion group. They also suggest bringing the discussion group topics into the classroom, and making it an integral part of the class (Yagelski & Grabill, 1998). It is argued that CMC can create more participation and a higher sense of community, but that will not happen automatically.

Using instructional technology successfully involves structuring the technology to fit the learners' needs, and avoiding the temptation to focus more on the technology than

on teaching and learning. A Web-supplemented class would not be effective without the support of the instructor. In a learner-centered environment the instructor serves as a facilitator as opposed to a lecturer. In this environment it is up to the instructor to successfully involve the students in the learning process. In a Web-supplemented course, this can be accomplished with strategic uses of the technology. In this particular class, technology was integrated into the class through a partnership with the instructor and instructional designer.

With all the advances in technology, the relationship between the instructor and instructional designer becomes increasingly important. Previous research has detailed appropriate technological strategies for the instructor to design into the course, and the instructional designer can ease the burden of integrating online tools and serve as a consultant. Previous studies have not discussed this relationship or given the instructor and instructional designer the opportunity to reflect on their experiences. This case study brought two individuals together in a partnership. The fourth research question addresses this and the lessons learned by evaluating the instructor and instructional designer and make it possible to paint a clearer picture on

how to best create a learner-centered, Web-supplemented course.

> **Research Question 4**: What lessons were learned through the partnership of the instructor and instructional designer?

CHAPTER 3: METHODS

SURVEYS

Three surveys were administered to the students enrolled in the fall 2001 semester of JLMC/TSC 474: Communication Technology and Social Change. The first survey was given to the students on the first day of class on August 28, 2001 (n= 34). The second survey was given to students in the middle of the semester on October 18, 2001 (n= 24). The third and final survey was administered near the end of the semester on December 13, 2001 (n= 25). All three surveys were identical, except the final survey included additional semester-end questions.

The surveys measured such variables as computer use, attitudes towards using computers and technology in education, attitudes toward learner-centered and teacher-centered activities such as classroom discussion, lectures and group projects. The surveys were used three times to identify changes in responses over the course of the semester. Students were asked to include their names on the surveys in order to do comparisons over time. Student responses were kept confidential and did not affect their grades, and the students were informed of this.

WEBCT

The instructor used the available tools and purposely exposed the students to various online technologies as a supplement their learning. Although there are many online course management system alternatives, this study used WebCT. WebCT (Web Course Tools) is a browser-based environment that allows the instructor to choose from communication, content, evaluation, and organizational tools. WebCT was the technology of choice because it is widely used at Iowa State University for online delivery or support of instruction. To reduce technology apprehension, the students were given an in-class demonstration of the WebCT tools they would be using.

The primary WebCT tools used by this course were the communication tools, discussion (bulletin board) and chat room. These tools were chosen because research points to their benefits in learner-centered instruction (Bonk & Cummings, 1998; Knowlton, 2000; McMurdo & Meadows, 1996; Oliver, 2000). Online discussions are characterized as an asynchronous text-based communication tool. Chat is a synchronous communication tool, meaning all participants must be present (online) at the same time in order to participate.

STUDENT OWNERSHIP

In an effort to involve the students in the learning process, on the first day of class the instructor asked the students if they would like to have a choice of the material studied throughout the semester. If so, this meant the students would introduce their own topics of interest. The instructor would then facilitate a negotiation with the students to create a syllabus. This also would mean the students would be responsible for researching and presenting relevant material to the rest of the class. If the students were not interested, the instructor would prepare the syllabus, give the majority of the lectures, and determine the required readings.

Keeping the learner-centered principles in mind, this was done to determine the students' willingness to accept responsibility for their own learning. It was thought that students at this level of their education would be open to the idea of choosing the course direction. As a class, they did agree to this learner-centered approach to the class. This choice affected how the class was structured for the rest of the semester, and the impact will be discussed in the results.

One of the items on the end of the semester survey asked students to list and explain two things they enjoyed about the

course. A content analysis of student responses was used to determine if any of the students identified with the idea of student ownership as being one of the things they enjoyed about the course. The statements of enjoyment were combined for each student and the coders were asked to indicate with a yes or a no if any of the student's responses identified with this theme. Four independent individuals were involved with the coding of the statements and participated in a brief training session that gave an overview of what the researcher was looking for, as well as examples of what would be considered a positive statement about student ownership and control and what would not be. They were also given written instructions (shown below) to serve as a reference during the coding.

> Coding Instructions: For the student responses listed below, please select whether any of the students' statements indicate a positive statement dealing with the theme of student influence and ownership in the class, by marking the response(s) with a "yes" for a positive indication, or "no" if the statement(s) do not mention the theme. Those positive statements include mentioning students being involved and having input or a choice in the direction of the course, or being allowed to explore their unique interests. An example of what would be considered a statement dealing with student ownership would be, "we were allowed to have input in the direction of the course," or "we had the ability to choose topics based on our interests." Statements that would not qualify are statements dealing only with the instructor's qualities or content alone, such as "the instructor was very experienced with the subject," or "I thought the readings were interesting." Other non-qualifying

statements are those that mention the technology or assignments but have nothing to do with the theme of student ownership, for example, "I liked the chat," or "I liked the group projects." However, a statement about technology or assignments would qualify if the statement mentioned student ownership, such as "I liked the group projects because students were able to introduce their own material into the classroom."

THE DISCUSSION BOARD

Students were required to introduce themselves to the rest of the class using the online discussion board in WebCT. The dual objectives were easing student tension toward the technology, and creating a safer learning environment for collaboration. For the introductions, students were asked to tell a little bit of personal information about themselves, their major, and their interest in communication technology. The literature on learner-centered strategies mentions the benefits of including online introductions as an icebreaking exercise (i.e., Bonk & Cummings, 1998; Canada, 2000; Weiss, 2000).

The discussion tool was used in various ways during the semester. The students' first assignment was to visit a Website dealing with current technologies (http://www.nua.com), and post to the discussion board a summary of a technology that interested them. The following assignment asked the students to respond to at least two other students' postings that they also found interesting. This

process was used to identify possible topics for the syllabus and student presentations. The discussion tool was used by the class to collaboratively create the syllabus for the course.

During the semester every student was required to present a technology to the class. They could work individually or in small groups. Private online discussion areas were also set up for each group to aid in project collaboration. This meant only members of a particular group and the instructor and instructional designer could access that discussion area. Image 1 shows how the discussion forums were arranged once the syllabus had been decided upon. The topics marked "public" were available to everyone, while the topics marked "private" were only available to the students in that particular group.

Image 1: WebCT Discussion Board Forums

Topic	Unread	Total	Status
All	66	257	
Main	10	10	public, unlocked
Notes	0	0	public, unlocked
 The Coffee House	30	89	public, unlocked
Advertising	3	3	private, unlocked
Copyright, Royalties and Revenues	0	0	private, unlocked
Employment and Info Technologies	2	2	private, unlocked
Introductions	6	36	public, unlocked
New techn trends/impacts	0	0	private, unlocked
Newspapers and the Web	1	1	private, unlocked
NUA Surveys	7	96	public, unlocked
Pornography and the Web	0	0	private, unlocked
Security and Crime	4	11	private, unlocked
Sports and Children/Internet	0	0	private, unlocked
Wireless or Wired Futures	2	2	private, unlocked
Women and Seniors	1	7	private, unlocked

The discussion board is an effective way to facilitate informal conversation by creating an online gather place (i.e. Weiss, 2000). The "Coffeehouse" was an online discussion area created for this reason. Students were not required to use the Coffeehouse. It was simply a place for students and the instructor to extend the discussion outside the classroom or to share information or resources with other classmates. Although requiring students to participate in online discussions would lead to more use of the tool, requiring students to use the coffeehouse would not have given an accurate measure of the students who are more inclined to use the tool on their own.

THE CHAT ROOM

The chat room was used twice during the semester. The instructor and students logged into WebCT's chat room during regular class time instead of meeting face-to-face. In both instances, the students who were presenting that day were in charge of facilitating the interactions. The class was divided into four separate chat groups to make for more manageable communication. Students were given topics ahead of time and the student facilitators kept the conversations on track. During the second time using the chat room to hold class, the instructor was overseas and accessed the class from Russia,

and at least one student also accessed the course from another state.

One benefit of online communication is class discussions and chats are easily archived. The discussions were automatically saved in threaded topics. In WebCT the instructor is able to access the chat logs (similar to bringing a tape recorder to a face-to-face classroom). These chat logs were converted to Web pages and shared with the rest of the class. This archive of communication also makes studying interactions in education more convenient.

THE FINAL EXAM

Keeping with the idea of giving students a choice in their learning, students were also given a choice at the end of the semester of how they were to be assessed. Students had the choice of two final test options. The in-class exam was taken during the allotted testing period under the supervision of the instructor. This was a closed book essay test dealing with materials covered throughout the semester. This exam was a more traditional assessment asking the students to recall concepts and demonstrate their understanding during a two-hour testing period.

The other final exam option was taking a final quiz online using WebCT's quiz tool. This was also delivered as an

essay exam. The difference with this exam was students had a week to complete the exam on their own time. The students who chose this option were allowed to read the previous course materials, threaded discussions and chat logs. They were also encouraged to seek out additional resources.

Although choosing the open-book test with a week to complete seemed like the obvious choice, the online test consisted of more advanced questions and required a deeper level of sophistication and understanding in the responses. The online quiz had the benefit of allowing more time and access to resources, but more was expected of the students. Students were required to use additional resources in support of their answers. Students had to make the choice of which exam they were taking ahead of time without seeing either of them.

THE INSTRUCTOR AND INSTRUCTIONAL DESIGNER

Online learning technology such as WebCT and communication programs are the tools that foster and create a learning environment online, but the tools are not the only necessary ingredients in an online or Web-enhanced course. The instructor is an integral part of the online learning experience. It is up to the instructor to structure and manage the course in such a way as to promote learning. Especially

in a learner-centered approach to teaching, the instructor takes on the important role of facilitator or guide.

Another increasingly important player in online educational experiences is the instructional designer. The instructional designer's role is to understand the current educational technology and support faculty in their efforts to integrate technology into the classroom. Incorporating technology into the classroom can be a daunting task for an instructor who must first learn the programs and then determine the best ways to use these programs to enhance learning. The instructional designer can serve as a consultant in how to best use the technology to meet the learning objectives.

The partnership between the instructor and instructional designer began during the developmental stages of the course. Although the instructor had taught this particular class before, he was open to the idea of integrating technology into the classroom. During their first meeting before the course began, there was a discussion of the technology available and how it could potentially be used to facilitate restructuring the course. Subsequent meetings allowed the instructor to solidify his approach. The instructional designer supported the instructor in creating the WebCT course and organizing all

the available tools that would be used. In order to reduce student apprehension toward WebCT, the instructional designer offered in class demos on the use of all the tools that would be used during the semester. After the course was underway, the instructor and instructional designer maintained their dialog and assessed the effectiveness of using the technology to facilitate learner-centered instruction.

Because of the integral role the instructor and instructional designer played in this case study, it is important to consider their experiences. Evaluating the experience from the instructor's point of view was accomplished by asking a series of semester-end questions. For this case study, the author served as both the researcher and a participant. The author's full-time position as an instructional development specialist at the Instructional Technology Center allowed him the opportunity to work closely with the instructor to organize and develop the online learning activities and materials. Because of the author's role in this class as the instructional designer as well as the researcher, he also answered a series of questions following the completion of the course, and approached these questions from the perspective of his role as instructional designer.

CHAPTER 4: RESULTS AND DISCUSSIONS

STUDENT CHOICE AND MOTIVATION

Student involvement is an important component to the learner-centered classroom. To determine students' willingness to participate in a class structured more around student interests, the instructor simply asked them. The course began by giving the students a choice. As mentioned in the methods, the instructor gave the students the option of helping to define the syllabus, which also meant students would be responsible for a large majority of the course material and discussions. The alternative was the instructor would choose the required readings and the class would be more lecture-oriented. As a class they agreed that they would like to have some ownership of the class. This fundamentally determined how the class was structured.

The students' acceptance of ownership of the class material meant they also accepted additional responsibility for their own learning. The students agreed they preferred the learner-centered approach. Although they recognized the importance of lectures (see Table 4), they did not want to be passive learners. This supports the literature that students want ownership of their learning (McCombs & Whisler, 1997; Lambert & McCombs, 1998; Alexander & Murphy, 1998) and should

be challenged with high expectations (Chizmar & Walbert, 1999). The research is also clear on the impact of perceived student ownership on increasing motivation.

A very telling and important result of the study was the students' responses on a particular item on the semester-end survey that asked students to list and explain two things they enjoyed about the class. Twenty-five students completed the final survey, and twenty-three of them answered the survey item about what they enjoyed about the course. The interesting finding was the large portion of students who mentioned their enjoyment of having an influence on the direction of the course. The statements dealing with this theme were determined by the content analysis of the four independent coders described in the methods section. Student responses identifying with student ownership are listed in table 1.

For a student's statements to be included in this list, three of the four coders must have selected the student as indicating an enjoyment of student ownership or control. Fourteen out of 23 (or 61 percent) of the students who completed the survey item were identified as mentioning this theme. Reliability was measured and the percentage of agreement among the coders was calculated to be 75 percent. Although the four individuals were in close agreement in their

coding of the statements, with only 23 respondents, slight variations affected the inter-coder correlation more than if the number of respondents had been larger.

Table 1: Student responses about student ownership and control

List and explain two things you enjoyed about this class.

- The instructor was very open to student input; Students chose the direction the course took, but were guided by the professor.
- Instructor's broad knowledge; The students decided where the class went.
- Group learning; Able to explore my own interests.
- Exploring our own interests; Instructor was very knowledgeable.
- I enjoyed learning more information about all techniques in general, particularly advertising; I enjoyed getting to hear everyone talk about area of interest.
- That we were able to direct the class; I enjoyed the online discussions, it was an experience.
- I enjoyed hearing others' viewpoints of subjects; I enjoyed individual/interactive presentations.
- The class was student based - interest areas; Online chats - having class online.
- Open structure - we learned what interested us; I can teach others about my specialty.
- The way topics were chosen; Hearing other students take on the topics.
- We were given the opportunity to choose what we learned about
- Ability to choose topics
- Presentations - being taught be peers as well as instructor; Having students determine the direction of the class.
- We ran the class by talking about what we wanted; Online chats - it is so much more interesting and interactive than classroom discussions.

The instructor gave the students an additional choice of how they would like to be assessed at the end of the semester. For the final, students were given the option of a closed-book, in-class final that needed to be completed within the two-hour test period, or a more in-depth online final. Students were given a week to complete the online final, but the questions were more involved and students were required to

pull in additional resources and encouraged to look at the other students' online contributions. Although the in-class final was shorter and less involved, 75 percent of the students chose to take the online final. When given the choice, the students in this class preferred the option that required a demonstration of deeper learning and less memorization. When given the choice, a majority of the students preferred the option that challenged their critical thinking skills more.

The overwhelming appreciation for student ownership of class material and the effects of giving students choice supports the literature on the learner-centered principles and motivation. The students in this class realized they were not passive recipients of knowledge from the instructor, but were active in bringing their own knowledge to the class. Not only did they recognize that fact, but they appreciated the opportunity. In fact, in a semester-end survey item, 100 percent of the student respondents felt they were allowed to explore their interests. More than 95 percent of the students indicated they enjoyed the class and were motivated to learn. The findings outlined above strengthen the case for incorporating the learner-centered principle of student

ownership into instruction, and the use of technology may help to facilitate that approach.

STUDENT ONLINE EXPERIENCE

In a learner-centered environment, being aware of students' diverse backgrounds and experiences is important (APA, 1995). At the beginning of the study student use of computers and online technology was assessed. Using the Internet in an educational setting was not something new to them; in fact, everyone had previously used it as a means to interact with their instructor, their peers, and class materials. All of the students had used the Internet to search for information, used email to communicate with the instructor, and used email to communicate with another student in a class. More than half of the students had used the Internet in a collaborative fashion, participating in a group project partially done online.

The majority of the class had also used the Internet to access their grades and syllabus online. Students had less experience with instructional applications of such online tools as the discussion board, chat, and quizzes. Students also did not have much experience with Web-supplemented or Web-based courses. Although students had limited experience with the discussion and chat tools used in this course,

through email they all had previous experience with online interaction. Table 2 shows the actual percentages of student experience with online technology in an academic setting.

Table 2: Initial online Experience (n=34)

	Yes
I have used the Internet to search for information for a class.	100.0%
I have used email to communicate with the instructor of a class.	100.0%
I have used email to communicate with another student in a class.	100.0%
I have used an online discussion board to discuss a topic for class.	36.7%
I have used an online chat room for a class.	20.0%
I have participated in a group project done partially online.	56.7%
I have participated in a group project done completely online.	6.7%
I have taken a quiz online.	70.0%
I have checked my grades online.	93.3%
I have looked at the course syllabus online.	90.0%
I have taken a course that was taught partially online.	26.7%
I have taken a course that was taught completely online.	23.3%
I have used WebCT as a supplement to a face-to-face course.	3.3%
I have used WebCT to take a course completely online.	3.3%

INITIAL STUDENT ATTITUDES

The class also had fairly positive attitudes toward computers and the Internet. A concern with Web-based or Web-supplemented classes is the students' reactions to using a computer as a large part of class. Aside from already having experience on some level, most of the class already felt comfortable using computers and in fact enjoyed using them. Most students enjoyed communicating with others online. More than half of the students already had an interest in taking a class completely online. Table 3 shows initial student attitudes toward computers, the Internet, and online learning.

Table 3: Initial attitudes about computer use (n=34)

	Disagree	Neutral	Agree
I am comfortable using computers.	0.0%	3.3%	96.6%
I enjoy using computers.	3.3%	3.3%	93.4%
I am comfortable using the Internet to search for information.	0.0%	0.0%	100.0%
I enjoy communicating with others online.	13.3%	10.0%	76.7%
I would be interested in taking a class completely online.	23.4%	20.0%	56.7%

Students were also asked about their attitudes and enjoyment of lectures, in-class discussions, group work, and online discussions. The survey data clearly did not show students at different ends of the spectrum, with some students favoring in-class lectures in a traditional face-to-face environment and others more inclined to enjoy the in-class and online discussions. Students could not be classified into groups in which some students were more comfortable with an instructor-centered approach, and others enjoyed a learner-centered approach. A quick glance at the data indicated their attitudes were not dichotomous.

The majority of the students recognized the importance of lectures, discussions, and group work for understanding class material. Similarly, students indicated they enjoyed all three classroom activities (see table 4). For online discussions, students were more neutral about their enjoyment and perceived importance in class. Lack of experience may have caused this indifferent attitude. Before this class only 37 percent of the students surveyed had used an online discussion board to

discuss a topic for a class and only 20 percent had used an online chat for class. A neutral attitude about online discussions is understandable. However, the fact that these students had positive attitudes about lectures, discussions, and group activities alike shows they are open to various learning options and supports the notion that students have the capability to engage the material in multiple ways.

Table 4: Initial attitudes about teaching methods (n=34)

Lectures	**Disagree**	**Neutral**	**Agree**
Teacher lectures are important to my understanding of the class material.	3.3%	10.0%	86.7%
I enjoy lecture-oriented courses.	6.7%	16.7%	76.7%
Discussions			
In-class discussions are important to my understanding of the class material.	0.0%	13.3%	86.7%
I enjoy discussion-oriented courses	3.3%	6.7%	90.0%
Group Activities			
Group activities are important to my understanding of the class material.	6.7%	16.7%	76.6%
I enjoy group activities.	13.3%	16.7%	70.0%
Online Discussions			
Online discussions are important to my understanding of the class material.	13.3%	70.0%	16.7%
I enjoy online discussions.	23.3%	56.7%	20.0%

Before the course even began, every student already had some experience with using the Internet for some class activities. For this reason, this class tended to be more positive about technology in the classroom. Previous experience may have made students more receptive to its use. Students also reported fairly positive attitudes toward different learning strategies. This signifies instructors may

have options in how they engage their students, and in fact, students may prefer options.

STUDENT ATTITUDE CHANGES

Students overall were initially fairly positive in their responses to the survey, and for the most part remained positive. However, the first and final surveys were analyzed to determine if there was any significant change in student responses. To analyze the change reported by students between pre- and post-data, the McNemar test for comparing dependent proportions was used (Agresti & Finlay, 1997). The McNemar test measures the difference between paired proportions for before and after data (MedCalc, n.d.). To prepare the data, a four-cell matrix was created for the survey questions which used the "strongly disagree" to "strongly agree" likert scale. Students who indicated "strongly disagree" or "somewhat disagree" to an item in the first survey and had "strongly disagree" or "somewhat disagree" selected for the same item in the final survey were placed in the "remained negative" cell. It was considered a positive change for students who indicated "strongly disagree" or "somewhat disagree" in the first survey, and selected "neither agree nor disagree" (neutral), "somewhat agree," or "strongly agree" in the final survey and were placed in the "moved positive" cell. Students moving from

"neutral" to "somewhat" or "strongly agree" were also placed in the "moved positive" cell.

The same rules applied for students who began by selecting a positive response. Those who remained positive were placed in the "remained positive" cell. Those who shifted from "strongly agree" or "somewhat agree" to "neutral," "somewhat disagree," or "strongly disagree" were placed in the "moved negative" cell. Changing from "neither agree nor disagree" to "somewhat" or "strongly disagree" was also counted as a negative shift. Students who began with a neutral response and remained neutral were placed in the "remained negative" cell. This did not affect the data as only the change cells were needed for the McNemar test. A graphical representation of how the data was prepared for the test is shown in table 5.

Table 5: Coding data for the McNemar Test

		Time 2				
		Strongly Disagree	**Somewhat Disagree**	**Neither Agree nor Disagree**	**Somewhat Agree**	**Strongly Agree**
Time 1	**Strongly Disagree**	Remained Negative	Remained Negative	Moved Positive	Moved Positive	Moved Positive
	Somewhat Disagree	Remained Negative	Remained Negative	Moved Positive	Moved Positive	Moved Positive
	Neither Agree nor Disagree	Moved Negative	Moved Negative	Remained Negative	Moved Positive	Moved Positive
	Somewhat Agree	Moved Negative	Moved Negative	Moved Negative	Remained Positive	Remained Positive
	Strongly Agree	Moved Negative	Moved Negative	Moved Negative	Remained Positive	Remained Positive

The results from coding the pre- and post-data for the survey items were then placed in a 2x2 matrix (table 6).

Students who shifted their attitudes about an item according to their responses from the first to the last survey were the only necessary components for this test (represented in cells "a" and "d").

Table 6: 2x2 Matrix for McNemar Test

	Time 2	
Time 1	(a) Moved Negative	(b) Remained Positive
	(c) Remained Negative	(d) Moved Negative

For most survey items students began the course with positive responses, and in most cases remained positive at the conclusion of the semester. For these areas, there was no significant change. This is important, because students were not deterred after using the technology in a Web-supplemented class. When they completed the course, as a whole, they were still very positive about technology. They also still reported high attitudes about lectures and in-class discussions.

Although for most survey items there was little change, there were four significant changes in student responses (shown in table 7). After using the discussion and chat for class activities, student enjoyment of online discussions increased significantly ($p<.05$). Recall that before this class only 37 percent of students had used the discussion board in a class, and only 20 percent had used a chat room. Although their experience was limited for classroom applications,

before this experience 77 percent of the students already enjoyed communicating with others online. Before the class, the majority of students were neutral about their enjoyment of online discussions, with 23.3 percent negative, 56.7 percent neutral, and 20 percent positive. After the course 12 percent still did not enjoy online discussions, 36 percent were neutral, and over half the class (52 percent) indicated they enjoyed online discussions. This finding suggests that exposing students to these classroom applications can increase their enjoyment of them.

Table 7: Significant change results for McNemar Test

I enjoy online discussions.	Positive Change	5.818*
I often voluntarily participate during online discussions.	Positive Change	12.071***
Participating in online discussions makes me nervous	Negative Change	6.75**
Group activities are important to my understanding of class material.	Negative Change	5.444*

*p<.05, **p<.01, ***p<.001

There was also a significant change in perceived voluntary participation for online discussions (p<.001). After the course, more students agreed that they voluntarily participate during online discussions (92 percent) as opposed to agreeing to the statement before the class (26.6 percent). This finding seems obvious since many of the students did not have previous experience with online discussion tools for classroom activity. What is interesting about this finding is that while perceived voluntary participation in the online

environment increased significantly, students' assessments of their participation during in-class discussions remained about the same, around 70 percent. This finding suggests students felt more willing to voluntarily participate in online discussions than voluntarily contribute in the classroom. This is because CMC is more convenient and the lack of physical presence causes lower apprehension levels. This finding has implications for student engagement and participation.

Before the class, 50 percent of the students neither agreed nor disagreed about whether participating in online discussions made them nervous; after the class there was a significant negative change ($p<.01$). This means by participating in online discussions, students realized it did not make them nervous. Compare this to in-class discussions where at the completion of the course 56 percent of the class felt nervous about participating in class, and only eight percent felt nervous about participating in online discussions. Incorporating online discussions into a class promotes more participation among students who may feel apprehensive about speaking up in class.

The fourth significant change in student attitude dealt with group activities being important to their understanding of class material ($p<.05$). This was a shift in attitude

towards the negative. After the course, students were less convinced of the importance of group activities in class. Although there was a negative shift, over half of students (60 percent) still recognized the importance of group activities at the completion of the course. Twelve percent of students disagreed with the idea that group activities are important, and 28 percent were neutral. Contrasting this with student views before the class (6.7 percent disagreed, 16.7 percent neutral, and 76.6 percent positive); many of the students who had previously agreed with the statement became more neutral on the topic. This is probably because of their experience of working in groups to gather the content and present it to the rest of the class. This finding may have implications for how peer collaborative work is structured.

STRATEGIC TECHNOLOGY INTEGRATION

This study used an exploratory approach to evaluate technology in the classroom. The main instructional tools used in this study were the discussion board and chat room available in WebCT. The tools were used in a manner consistent with the learner-centered principles and collaborative strategies of computer-mediated communication discussed in the literature. After using these tools for various instructional applications, students were asked to evaluate their

experiences through survey items. WebCT also has the capabilities to track certain usage statistics for further evaluation.

WebCT is a virtual toolbox of instructional support tools, including content, communication, and evaluation tools. Although there are a variety of applications for these tools, the technological strategies used in this case study primarily incorporated the discussion board and chat room. Overall, the use of WebCT in the class was considered a positive experience. More than 90 percent of the students felt that the use of WebCT in this class was beneficial to them. This is important, because as a whole, students found value in the use technology and did not feel it detracted from their learning experience.

Online Introductions

The discussion board was used for a variety of applications in this course. On the first day, the instructor assigned the use of the discussion board. The first assignment was for the students to introduce themselves online. This assignment served two purposes; to give the students an ice breaker exercise to become more familiar with WebCT and the discussion board, and as a strategy to help establish a safe learning community. The discussion board works well for this

type of application because all students have a chance to participate without time restrictions and their introductions are accessible throughout the semester for other students to reference.

The instructor not only asked for their name and major, but also asked to them to share some personal information as well as their specific interests in this class. Asking the students to share what interested them about communication technology served as a primer for the second exercise. Fifty-two percent of the students enjoyed the online introductions of the students, while 40 percent were neutral. Many of the students (48 percent) were neutral as to the perceived benefit of the online introductions, while 32 percent did find benefit in the exercise. The majority of this particular class either enjoyed the online introduction exercise and found it beneficial, or at least was not opposed to it.

Defining the Syllabus

The second exercise that was assigned on the first day required the students to read through the articles of a Web site (www.nua.com) and use the discussion board to introduce to the class a technology or technological issue that interested them and explain why. This exercise forced the students to interact with the content, but gave them the

freedom to center their exploration on their interests. The following class period, the instructor assigned them to read through their classmates' submissions and comment on at least two other students' contributions. Ultimately, this exercise was designed to facilitate the creation of the syllabus. The students' interests were represented by the discussion items, and were used by the instructor and students to create presentation groups and determine the direction of the course. As mentioned earlier, designing the syllabus with the instructor was very well received by the students, and the discussion board served its purpose well by allowing all students the chance to contribute.

Private Group Discussion Forums

The online introductions and accessing the NUA Web site were the only exercises where the instructor required the students to use the discussion board. Although requiring student participation would have led to greater use, it was up to the students whether they continued to use this tool. Based on interests, students either presented alone or were broken into presentation groups of two to five people, and were responsible for leading the class for that particular topic. To aid in group work and collaboration, discussion areas were set up for each group.

Although these groups were set up to aid in collaboration, most groups did not take full advantage of their group discussion areas. Four of the ten groups did not use their group area at all, four groups posted three or fewer times, one group posted seven times and another group posted eleven messages. Of the postings that were made, many of them dealt with planning group activities or scheduling face-to-face meetings. There was some activity that could be considered collaborative, such as sharing of ideas and Web sites, but it was limited. It seems that for this class, the students preferred to do the majority of their group work outside the Web environment. If given the option, students may still prefer collaborating face-to-face.

The Coffeehouse

To facilitate class collaboration and construction of knowledge, the instructor created a virtual "coffeehouse." The coffeehouse was a completely voluntary discussion area available for students to use however they saw fit. It was hoped students would use it as a place to share resources and discuss classroom-related topics outside the confines of the physical classroom. Although it was limited, there was some evidence of this. Students used the coffeehouse to share their presentation materials, Web links, and ask questions. There

was also an instance where a student used the coffeehouse to ask a technical question. Three other students offered suggestions to the problem. Some groups asked follow-up questions to their presentations, and the students answered these questions in the coffeehouse. The instructor also posted questions after the student presentations to activate discussions, and often received a couple of responses.

Again, use of the coffeehouse was not required, but used more as an electronic gathering place. Although it may have been beneficial to structure uses of the coffeehouse into the class, this exploratory study wanted to gauge their willingness to use the technology without prompting. Almost half of the students (48 percent) enjoyed the coffeehouse and 44 percent were neutral. Almost a third of the students found benefit in the use of the coffeehouse, and over half were neutral. The students of this class seemed to have either positive attitudes about the inclusion of the coffeehouse or were indifferent. Students disliking the use of the coffeehouse were minimal. The fact that some students enjoyed the coffeehouse and even found benefit without any structured activities indicates that more intentional use could lead to even more benefit.

Student Use of Discussions

One of the significant changes in student attitude mentioned above was feeling that students voluntarily participated more for online discussions. The definition of "frequent voluntary participation" was subject to the discretion of the students. Participation could be considered reading the discussions as well as posting them. Looking at the actual number can give better insight into the actual participation of students. Using WebCT's student tracking options, it was possible to get the exact number of each student's discussion contributions as well as how many he or she read. The number of items posted during the semester ranged from only one to 15 contributions. The number of postings read by students ranged from seven to 239. Thirty-four percent of the students read more than 100 discussion items, even though it was never a requirement. In total, there were 257 discussion postings in the course, with 231 of them in forums that were available to all students.

Overall, it is clear the students had a fairly positive impression of the discussion tool. This tool worked well to have the students introduce themselves and share some of their interests. Their interests then became part of the syllabus through their Web activity and discussions. Since 100 percent

of the class felt they were allowed to explore their interests, the discussion board facilitated this activity very well. Students opted for other methods of group collaboration than the private discussion areas. Although use of the coffeehouse was not substantial, it was of benefit to some and students either enjoyed or were not opposed to it.

Students were open to the use of the discussion board in this class. When they did use it, they were not against it. Understandably, students did not feel the need to abandon face-to-face discussions in light of this technology, but they were accepting of its applications. Although they were open to the discussion board, more than half of the students (56 percent) were neutral about liking to see more online discussions in the class. Twelve percent wanted more online discussions and 32 percent did not. Many students saw value in its use in this class, but were fairly indifferent about its continued use. This hints that students saw the discussion board as a supplemental tool, and not as a replacement of traditional interaction. The discussion board can be used effectively in the classroom to give value to certain applications.

The Chat Room

The chat room is another tool available in WebCT that allows for synchronous (real-time) communication among students and the instructor. As mentioned in the methods, this tool was used by the instructor to give student presenters the option to facilitate online discussions of their topics. The second time the instructor and students met in a chat room was because of necessity, as the instructor logged in from Russia to participate with the class. Students were divided into four chat rooms, each facilitated by a student presenter. After the live chat sessions, chat room logs were converted to Web pages, placed within WebCT and shared with the class. Students were also asked to use the discussion board to share their chat room experience.

The majority of students used the coffeehouse to share what they discussed in the online chat room. Some students even directly discussed their experience with using the chat tool for an online class. Many of the students indicated they enjoyed the chat room and felt more people were allowed to participate, but still preferred meeting in person. One student even suggested having already established relationships in person, led to a more successful online chat.

> "I haven't participated in a WebCT chat before today. I liked the way everyone had a chance to contribute their

> opinions and be heard. Plus, working from a location of our choice is pretty nice. However, I'm glad I had a chance to meet the people I was talking to face-to-face before just talking to them online. The conversation was more real and I knew how to interpret what people were saying."

As with the discussion tool, students were fairly positive about the online chat room. Fifty-six percent of the students enjoyed meeting online for class, and 28 percent were neutral. Students were not apprehensive about participating in this environment as 70 percent of students felt comfortable "speaking" with others in the class and 20 percent were neutral. Using the chat room may also help to promote participation. Almost 60 percent of the students felt they were able to participate more in the chat room than in a regular classroom, and almost 30 percent were neutral. The qualities of both the discussion board and chat room allow for increased participation from students, which is something sought after in a learner-centered classroom.

The students also took advantage of the logging capabilities of the chat room. Using WebCT's page tracking features, it was possible to gather the data on how many times students viewed the chat room logs. Although it is not possible to tell which students accessed what pages, it is apparent that students were viewing the archives of the chat discussions after the fact. Table 8 shows a breakdown of the

chat rooms, how often the logs were accessed, and average time spent on the page. Having textual representation of conversations is something students may find useful, and is an additional benefit of this technology.

Table 8: Chat Room Log Access

Chat Room	Hits	Time/Hit (minutes)
11-15-01		
Chat Room 1	22	05:17
Chat Room 2	17	05:16
Chat Room 3	8	07:33
Chat Room 4	11	02:01
12-04-01		
Chat Room 1	10	03:42
Chat Room 2	9	10:33
Chat Room 3	15	26:40
Chat Room 4	14	05:21

Much like the discussion board, students were mostly positive about their enjoyment and comfort level with the chat room. However, many students were indifferent about using it more in the class. When asked about whether they would have liked to see more use of the chat in this class, 45 percent did not care either way, and 33 percent would have liked to see more. Students were not overly enthusiastic about demanding its use in the class, but many enjoyed the experience and were open to its use as a classroom tool.

Overall, the use of computer-mediated communication, specifically the discussion board and chat room, was well-received in this class. Most students evaluated the use of these tools positively, or were at least neutral on the

matter. The discussion board successfully facilitated the merger of student interests with the syllabus and through the coffeehouse, gave the students an alternative method of participation. The chat room allowed student discussion facilitators to engage all students. A majority of the students felt comfortable participating in online chats, and felt they were able to participate more in this environment than in the face-to-face classroom. The strategic use of these tools in the classroom has implications for collaboration, participation, and enjoyment.

THE INSTRUCTOR AND INSTRUCTIONAL DESIGNER

This experience was as much a learning experience for the instructor as it was for the students. This course was the first time the instructor had used much of the technology or tried teaching a course in this manner. It was a learning experience for the instructional designer as well, who had not previously had the opportunity to closely evaluate the instructional applications and implications of WebCT in a learner-centered model. Since it is up to the instructor (and in some cases instructional designer) to effectively integrate the use of technology into the classroom in meaningful ways, they are major players in the Web-supplemented environment. The instructor and instructional designer were as much a part

of this case study as the students. For this reason, a qualitative approach was used to include their experiences.

It was recognized that students clearly enjoyed and appreciated having the ability to shape the course. The instructor previously taught this course, and noticed a difference with this class. "This idea of being more involved in the class--along with required student presentations--led to an atmosphere in which many more students participated in class discussions than had been the case in previous semesters." In fact, a third of the students indicated that they felt they participated more in this class than in other classes. This is evidence that when student interests are considered, participation increases. The instructor also reported increased attendance compared to previous semesters, which is interesting since the class was moved from noon to 8 a.m. Although these are self-reports, student survey responses support some of the instructor's claims. Giving students ownership of the course seemed to have affected student behavior, or perception of their behavior.

According to the instructor, the downside to putting the students in charge of introducing the majority of class material was that some of the conceptual or theoretical material often covered in the lectures was not discussed.

Although the class accommodated more student interests and had more breadth of coverage, there was less depth. This discovery was also supported by the students' negative attitude change about the importance of group work to their understanding of class material. Many students also indicated on the survey they felt some of the student presentations were not valuable to them.

The instructor tried to counter this by interjecting textbook and other research material to support student presentations. According to the instructor, this was met with mixed results, as some students felt the instructor's contributions offered valuable perspectives; others felt the instructor was trying to assert his authority. The instructor and instructional designer alike recognized presentations may have had more depth and quality if clearer objectives and criteria had been specified. Defining clear and specific objectives and rubrics before the project begins are essential in a learner-centered classroom. This not only gives students a sense of ownership, but also a roadmap of exactly what is expected and needed to succeed (McCombs & Whisler, 1997).

As a result of this experience, the instructor concluded there are certain situations when a learner-centered approach is appropriate and other situations when a teacher-

centered approach is more appropriate. He reported the learner-centered model may work best when the students have existing knowledge of a topic, or actively confronting their beliefs. There are other times when a lecture is the best option, specifically for essential and technical knowledge that require the instructor's expertise. According to the instructor, there are times when there is a need for a sage on the stage, and times when a guide on the side is needed. In fact, there may be a healthy balance between the two.

There was also room for improvement in developing a collaborative online learning community. Both the instructor and instructional designer admitted that the coffeehouse suffered from lack of collaborative use, but still felt it had positive applications. The instructor indicated that he would like to repeat this concept for future courses. According to the instructor, the coffeehouse served well as a repository for class notes and materials, but unless more incentive is available students "don't just drop in for coffee." Regardless of the lack of use, the instructor plans to reevaluate the concept, perhaps by offering more incentive, and continue to use the coffeehouse.

Much like the students, the instructor and instructional designer both felt the use of WebCT in this class was

successful. They also both recognize that WebCT is merely a tool, and its success in a learner-centered environment depends more on how that tool is used. According to the instructional designer, for a Web-supplemented course to be successful, it must not be seen as a separate entity, but closely integrated with the face-to-face class. The instructor agreed:

> "I think the way that students are initially socialized as to how WebCT is going to be used is very important. If they see it as an optional add-on, they will not use it much. Therefore, steps have to be taken to integrate its use directly into the life of the course (and the grading). I think I as a professor must be much more attentive to what is posted at the WebCT site, and more responsive. If students see that I am there frequently and they can reach me in this way, it will increase overall use of the site."

Perhaps the most valuable result of this case study for the instructor was that it forced him to evaluate how the class was taught. Because of this experience, the instructor indicated he will change how he teaches this class in the future, as well as other classes. Both the instructor and the instructional designer recognized high levels or enjoyment, motivation, and participation in the students. This was present in both the online environment and the face-to-face classroom. Although the instructor and students were not ready to completely abandon the traditional classroom, they realized the positive applications of the technology. Although there

was room for improvement, this Web-supplemented class successfully capitalized on the benefits of both the traditional and online environment.

CHAPTER 5: CONCLUSIONS

By the time students reach an institution of higher education, they have many years of experience with the traditional classroom. The classroom reinforces the notion that the instructor stands at the front of the class and delivers information to the student through lectures. Students then prove their comprehension by repeating the information back to the instructor through assignments and exams. Although attitudes toward education are changing, the traditional classroom still places the instructor at center stage. Although lectures are an effective way to introduce information to a student, research has shown the benefits of giving the students a more active role in their learning (APA, 1995; McCombs and Whisler, 1997).

A learner-centered approach takes into consideration the importance of the student in the educational process. This is done by recognizing students' existing knowledge base, giving them opportunities to reflect, increasing motivation by giving students a choice, recognizing student differences, and realizing that learning does not occur in a vacuum (Alexander & Murphy, 1998). With this is mind, it is then possible to frame the use of online technology around these principles. This study attempted to do just that. It is also important to

remember that these conclusions are not generalizable. The results of this case study apply to this particular group of students, with their particular unique backgrounds, for this particular class. Although the conclusions are unique to this experience, the results of the study do support the existing literature.

RESEARCH QUESTION #1:
What are the motivational effects of giving students a choice in a Web-supplemented learning environment?

The research is clear that many students want and appreciate ownership of their learning (McCombs & Whisler, 1997; Lambert & McCombs, 1998; Alexander & Murphy, 1998). Students' own accounts of their enjoyment of having a voice in the class direction support the literature detailing the importance of choice, which is known to increase motivation. Students overwhelmingly reported that they enjoyed the class and that they were motivated to learn in this class (over 95 percent). The instructor, who had taught this course previously, also made the observation that the students seemed to participate more and were more motivated. The choice the students made to have ownership of the course material placed much of the responsibility for learning in their hands. When the students were given the choice on their final exam, a majority of them also chose the more challenging online

option. Not only does choice increase motivation, when given the option, students choose to be challenged as well.

This case study shows the technology available in Web-supplemented courses (such as the discussion board) can be used successfully to foster student ownership and choice, which had a positive motivational effect. Allowing students to search online for relevant information and use the discussion board to develop the syllabus was an effective instructional strategy that led to an increased sense of ownership and motivation. One hundred percent of the student respondents felt this class allowed them to explore their interests. These findings of strengthen the argument for incorporating the learner-centered principle of student ownership into instruction, and the use of technology can help to facilitate that approach.

RESEARCH QUESTION #2:
What are students' initial experience and attitudes toward learning and the use of technology in a Web-supplemented class?

Most of the students in this class had basic experience with using the Internet for classroom activity. All of the students (100 percent) had used the Internet to search for information for a class, and all of them had previously used email to communicate with both the instructor and other classmates. Students had much less initial experience with the

use of other online tools for instructional applications, such as the discussion board (36.7 percent), chat room (20 percent), or taking a class completely or partially online (26.7 and 23.3 percent). This class exposed students to online situations that many were unfamiliar with, which is why understanding students' prior experience and apprehension is important (Fishman, 1999). The implication of this is when introducing these online applications into the classroom, training and practice opportunities may be necessary (McMurdo & Meadows, 1996; Olaniran et al., 1996). For this particular class, this was handled through in-class demonstrations by the instructional designer and requiring the students to introduce themselves online.

Although their experience with online learning applications was limited, the majority of students enjoyed and felt comfortable using computers. Many of them already enjoyed communicating with others online and were open to the option of taking an online course. The students in this class were also not dichotomous in their attitudes toward lectures, discussions, and group activities. Students had positive attitudes toward all of them, which suggests they recognized the importance of different teaching methods and strategies. An instructor does not have to follow a particular model at

the expense of another one. The results showed that students in this class had positive attitudes about various teaching methods and the use of computer technology in the class, and using WebCT as a supplement successfully allowed the instructor to involve the students in a variety of ways.

RESEARCH QUESTION #3:
How did a Web-supplemented experience affect their attitudes toward learning and the technology?

The students were not afraid or intimidated by the technology. In fact they enjoyed the use of the technology. As students were exposed to online discussions, their enjoyment of online discussions significantly increased. This is an important finding in that it suggests exposing students to this technology early in their education may reduce the barriers of using technology in the future. This idea is supported by the longitudinal study by Mitra and Steffensmeier (2000) which found students tended to view technology more positively and appreciated the interactions the "computer-enriched environments" facilitated. Students also recognize the benefits of using technology as a supplement to a face-to-face course (McMurdo and Meadows, 1996; Chadwick and Bayley, 1999). Web-supplemented environments may effectively allow students to slowly submerge themselves into the online

learning experience, as well as let them begin to take more responsibility for their learning.

Not only does use of technology lead to more positive attitudes of the technology, it may also influence attitudes about learning in general. A review of over 200 research studies found that computer use could actually improve student attitudes toward learning (Schacter, 1999). Although this case study did not directly address this issue, the course did successfully use the technology to create learning activities consistent with the learner-centered principles, which have been shown by the research to have a positive affect on learning. The technology can be used in a way that does not isolate the student from the learning environment. In fact the communication and collaboration tools can be used to promote more participation and involvement. Strategic use of the tools worked well to facilitate a learner-centered environment.

Not only does the technology help facilitate a learner-centered approach; there is evidence that students enjoyed the strategic uses of the discussion board and chat room. Many students also thought the use of these tools was beneficial. This includes the online introductions, defining the syllabus, the coffeehouse, and having class online. This study effectively demonstrated that these tools can not only be used

to promote learner-centered activity, but students also recognize the real benefit of these applications. This is important since the students did not feel the use of the technology was a novelty or a waste of time.

The use of computer-mediated communication (discussion board and chat room) also increased student participation in the class. This finding was reported by both the students and the instructor. Students felt comfortable participating online, and in some cases, were more comfortable doing that than participating in the face-to-face classroom. At the end of the class 56 percent of the students indicated that participating in class made them nervous, while only eight percent felt nervous about participating in classroom discussions online. This technology promoted increased participation, but students were not ready to abandon the physical classroom. Although students enjoyed the online discussions and chats, they still preferred face-to-face interactions.

In cases where the students did not have much experience to begin with, the use of these tools resulted in positive attitudes, as is the case with online discussions. Students still had positive attitudes toward the various teaching methods, with the exception of the importance of group

projects, which became more neutral. This implies the students recognized in some cases, the group presentations did not adequately introduce the material to the class. The instructor discovered the importance of setting clearer guidelines as to what is expected of them when using a learner-centered approach. Although the students in this course enjoyed their experience with the online tools and recognized some benefit, they were neutral about wanting to see more of it. After exposure, students are still open its use, but may see it more as a supplement than something that is a necessity in the classroom (McMurdo and Meadows, 1996; Chadwick and Bayley, 1999). Students did however remain positive about their experiences both with the technology integration, and the manner in which the course was taught. Overall, a Web-supplemented course designed around the learner-centered principles was a positive experience.

RESEARCH QUESTION 4:
What lessons were learned through the partnership of the instructor and instructional designer?

In this case study, it was the goal of the instructor and instructional designer to facilitate learning through the use of technology while following the learner-centered principles, which was a new experience for them. Although not a required participant in Web-supplemented courses, the instructional

designer served as a consultant for incorporating new technology which would best serve the learning objectives and be of benefit to the students. As evidenced by the negative change in attitude about the importance of group activity, students do recognize when they feel an activity does not have value. As mentioned earlier, the tools alone will not guarantee success (Jackson & Anagnostopoulou, 2001). These tools worked well in this study to establish a community of learners; in the end though, it is ultimately up to the instructor to frame the community around clear goals and objectives (Knowlton, 2000). In the case of the group activities, the instructor admitted students lacked some of the direction they needed to make it a learning experience for everyone. The students needed to know exactly what was expected of them. In a learner-centered environment, the instructor is the dominant factor to promoting student receptivity and motivation.

The instructor also recognized the need to be a bigger part of the online environment, and offer incentive for students to effectively use the options available. Clearer expectations and integration can also lead to more effective use of the tools (Coomey and Stephenson, 2001), which would have been beneficial for applications such as the coffeehouse.

The instructor may have promoted activity by bringing what was said in the coffeehouse into the face-to-face discussions. The online component of a Web-supplemented class should not be seen as something separate from the traditional class.

Through the partnership of the instructor and instructional designer, they recognized that WebCT can be used effectively as a supplement. They also recognized the importance of strategically integrating how the technology is used with the learning objectives. For example, the coffeehouse was recognized as a good idea, but they failed to successfully merge that supplemental component with the face-to-face class, so students did not recognize the value, and therefore it was not actively used to its full potential. The instructor did find value in the collaborative potential of the coffeehouse and plans to attempt using it again. This experience did positively affect the instructor who plans to incorporate some of these strategies into future iterations of this course as well as others. The main lesson learned by the instructor and instructional designer, however, is there is value in adding a Web-supplement for the promotion of a learner-centered classroom, and through their partnership, can work to achieve that environment.

SUMMARY OF CONTRIBUTIONS

Findings of this study indicate that when given the option, students like having ownership of their own learning. This led to high perceptions of motivation to learn and enjoyment of the class. Students were also open and willing to use technology in the classroom. In fact, the participants in this study found the use of technology both enjoyable and beneficial. The instructor and students both reported the technology facilitated increased participation as well. This study clearly indicates online technology can be used to effectively supplement a traditional class, while still following a learner-centered model.

From a learner-centered perspective, this signifies that students are open to participating in a learning environment that is not dominated by lecture. The research has shown the benefits of integrating the learner-centered principles, and this study suggests that students recognize the benefits as well. From a technological standpoint, student use and survey responses have shown that online tools can be successfully married to the face-to-face class to develop a Web-supplemented course that is learner-centered. This study exemplifies that the online tools should not be used without the careful consideration of how and why. For example, the

virtual coffeehouse may have been used more effectively if the instructor and instructional designer had planned more learner-centered activities that would have made its use necessary and beneficial. On the positive side, the discussion board was effectively used in a deliberate way to give students more ownership of the class. This was considered by many to be one of their favorite aspects of the class.

This case study is introduces ideas that can help faculty in developing their own Web-supplemented courses, such as the interplay between the elements that make up a Web-supplemented course (students, instructor, and technology). Although no two online or Web-supplemented courses will ever be identical, this study serves as one example for developing Web-supplemented courses based on the learner-centered principles. By simply taking what the research shows as effective for learning, and adapting that to an online environment, lessons can be learned from evaluating the experiences of this case study.

LIMITATIONS

This study is exploratory in nature and it can not be assumed that students in another course would have reacted to the course structure and technology integration in the same way. Since the instructor is an important factor in the

success of Web-supplemented courses (Alexander & Boud, 2001; Jackson & Anagnostopoulou, 2001; Yagelski & Grabill, 1998), the results were no doubt influenced by the instructor's teaching style. A different instructor with the same course organization could potentially result in very different evaluations of the experience from the students.

Student characteristics could have also influenced the results. Although the students did not have prior knowledge that the class would be structured in this manner, the course was about technology in society. The fact that the class dealt with the topic of technology may have attracted students who already had experience and an interest in computers. This also was an upper level class, and students who are farther along in their educational careers may react differently to this type of learning environment than first and second year students. Further studies that include students of different ages or courses in different fields would address this limitation.

Although students indicated they were motivated in this class, which has been found to positively affect learning, this study did not measure if the experience actually led to higher outcomes. The students in this study felt motivated as a result of the structure of this class, but it is not certain

what the result of that motivation was. Future comparative studies of learner-centered Web-supplemented courses and traditional lecture-oriented courses would offer more insight into whether or not the students' increased motivation had positive implications on learning. This study has shown that the technology can facilitate a learner-centered course, and that students are open to this approach, but more research is needed to further evaluate the effect this approach has on learning.

FUTURE RESEARCH

Research dealing specifically with Web-supplemented courses is limited. Web-supplemented courses have different qualities from the traditional classroom and a completely online course, and warrant dedicated investigations. This study found a Web-supplemented environment could effectively facilitate higher enjoyment and motivation, which has been argued to lead to higher outcomes. Additional research on the effect of Web-supplemented courses on student performance would support the conclusions of this study. Although studies of this nature already exist (i.e. Chadwick, 1999; Young, 2002), this area is relatively unexplored. There is a growing body of knowledge about the effectiveness on online learning, but these studies do not address the increased use of these

tools to support face-to-face classes, particularly in a learner-centered model.

For many of the students, this was their first experience with some of the technological applications. The novelty of new technology may have influenced student responses. Longitudinal studies testing student attitudes toward the technology over a greater period of time than one semester would show the long term effects of its use in the classroom. Would students lose interest, or would they adopt it as another effective tool for their learning toolkit? Would students begin to shift towards preferring a learner-centered approach and the applications of technology that supports that model, or would they develop a preference for a teacher-centered approach that utilizes the technology for its advanced content delivery ability? Does frequent use of the collaborative communication technology lead to a motivation for continued use? These would all be interesting questions to address in future longitudinal studies.

This study also introduces the potential benefit of partnerships between instructors and instructional designers. As more and more courses begin to move partially or completely online, it is important to develop them in such a way as to not alienate the student from the benefits of interaction. The

instructional designer can work with the instructor to integrate the technology effectively. Additional studies recognizing the importance of these collaborations for course structure and development would be helpful as a framework for future partnerships, particularly partnerships that successfully integrate the learner-centered principles into the online environment.

APPENDIX A: SURVEY INSTRUMENT

Name: _____ **(required)**
(note: your name will be removed and replaced with a unique ID number)

Date: _____

Please check all those that apply.
☐ I have used the Internet to search for information for a class.
☐ I have used Email to communicate with the instructor of a class.
☐ I have used Email to communicate with another student in a class.
☐ I have used an online discussion board to discuss a topic for a class.
☐ I have used an online chatroom for a class.
☐ I have participated in a group project done partially online.
☐ I have participated in a group project done completely online.
☐ I have taken a quiz online.
☐ I have checked my grades online.
☐ I have looked at the course syllabus online.
☐ I have taken a course that was taught partially online.
☐ I have taken a course that was taught completely online.
☐ I have used WebCT as a supplement to a face-to-face class.
☐ I have used WebCT to take a course completely online.

I am comfortable using computers.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoy using computers.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I am comfortable using the Internet to search for information.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoy communicating with others online.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

Teacher lectures are important to my understanding of the class material.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoy lecture-oriented courses?
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

In-class discussions are important to my understanding of the class material.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoy discussion-oriented courses?
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

Group activities are important to my understanding of the class material.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoy group activities?
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

Online discussions are important to my understanding of the class material.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoy online discussions.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I often voluntarily participate during in-class discussions.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

Participating during in-class discussions makes me nervous.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I often voluntarily participate during online discussions.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

Participating in online discussions makes me nervous.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I would rather listen to a lecture about the course readings, than discuss the readings in small groups.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I would rather contribute to an online class discussion than contribute to an in-class discussion.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I would be interested in taking a class completely online.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I often seek out related course information not required by the instructor.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I consider myself an independent, self-motivated learner.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I learn better when the instructor clearly structures the course and outlines the important points that I need to learn.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I learn just as well from discussions with other students as I do from the instructor.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

(Semester-end questions)

I enjoyed this course.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

The instructor allowed the students to explore their interests.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I was allowed to explore my interests.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I was motivated to learn in this class.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoyed the in-class discussions in this class.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

The in-class discussions were beneficial to me.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoyed the online discussions in this class.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

The online discussions were beneficial to me.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I participated more in class discussions than in other classes.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I felt comfortable participating in discussions for this class.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I would have liked to see more online discussions in this class.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoyed the online introductions at the beginning of the semester.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

Online introductions were beneficial to me.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoyed using the online "coffeehouse."
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

Using the coffeehouse was beneficial to me.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I enjoyed meeting for class online in the chatroom.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I was able to participate more in the chatroom than in a regular class.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I felt comfortable "speaking" with others in the chatroom.
☐ Strongly agree
☐ Somewhat agree
☐ Neither agree nor disagree
☐ Somewhat disagree
☐ Strongly disagree

I would have liked to participate in more online chats in this class.

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Neither agree nor disagree
- ☐ Somewhat disagree
- ☐ Strongly disagree

List and explain two things you enjoyed about this class.

1.

2.

List and explain two things you did not enjoy about this class.

1.

2.

Overall, I feel the use of WebCT as a supplement to this class was beneficial.

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Neither agree nor disagree
- ☐ Somewhat disagree
- ☐ Strongly disagree

Overall, I liked the open-ended way this course was taught.

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Neither agree nor disagree
- ☐ Somewhat disagree
- ☐ Strongly disagree

Please share any comments you may have about the use of WebCT in this class.

Please share any comments you may have about how this course was taught.

APPENDIX B: INSTRUCTOR QUESTIONS

1. What was your experience with using WebCT as a Web-supplement to this course?

2. How would you describe the students' experience with this course?

3. What was your experience with taking a more learner-centered approach?

4. In regards to using WebCT, what strategies do you feel were successful and were not successful?

5. What have you learned from your experience with using WebCT?

6. In regards to using learner-centered approaches to teaching, what strategies do you feel were successful and were not successful?

7. How have your perceptions about Web-supplemented instruction changed as a result of this experience?

8. How have your perceptions about learner-centered approaches to teaching changed as a result of this experience?

9. What sort of information, training, and communication do you feel that students need to have a positive online learning experience?

10. Do you feel using WebCT was beneficial to creating a learner-centered classroom as opposed to doing everything in class? Why or why not?

APPENDIX C: INSTRUCTIONAL DESIGNER QUESTIONS

1. In regards to using WebCT, what strategies do you feel were successful and were not successful?

2. In regards to using learner-centered approaches to teaching, what strategies do you feel were successful and were not successful?

3. How could the use of WebCT been improved to support a learner-centered environment?

4. How have your perceptions about Web-supplemented instruction changed as a result of this experience?

5. How have your perceptions about learner-centered approaches to teaching changed as a result of this experience?

6. What sort of information, training, and communication do you feel that students need to have a positive online learning experience?

7. Do you feel using WebCT was beneficial to creating a learner-centered classroom as opposed to doing everything in class? Why or why not?

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ACKNOWLEDGEMENTS

I would like to thank my wife, Lisa and my family for their ongoing support. Your dedication to me during this process was greatly needed and greatly appreciated. I would also like to thank my Major Professor, Eric Abbott for his input and direction.